



# Design of a new BSL/ABSL-III Facility in the Republic of Korea

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## Introduction

The Animal and Plant Quarantine Agency (QIA) is an agency which conduct a statutory diagnosis on livestock diseases including zoonoses and animal health research in the Republic of Korea. Currently, three BSL-III facilities – one on foreign animal disease including Foot & Mouth Disease (FMD, since 1995), one on the Highly Pathogenic Avian Influenza (HPAI, accredited by the Korean Center for Disease Control (KCDC) since 2010 because it is a zoonotic agent) and one on the Bovine Spongiform Encephalopathy (BSE, accredited by the KCDC since 2011 as a same reason) – are on the operation at separate places. However, the agency is planning to be relocated at the southern part of the Korean peninsula by the end of 2015 and a requirement of unification is brought up for safety and efficiency.

## Design of a new BSL/ABSL-III facility

Since 2011, a task force team for the new BSL/ABSL-III facility & biosafety has been organized and began working for the successful completion of the mission.

There are three related legislations – the Act for Prevention of Livestock Epidemics (controlled by the Ministry Agriculture, Food and Rural Affairs) and Infectious Disease Control & Prevention Act (controlled by the KCDC) and Act on the Control of the Manufacture, Export & Import, etc of Specific Chemicals & Chemical Agents for the Prohibition of Chemical & Biological Weapons (controlled by the Ministry of Knowledge, Economy).

Based on the related legislation and demand from users, a total of twenty pathogens have been selected to be worked in a new BSL-III facility. A total of twenty pathogens have been selected to be worked in a BSL/ABSL-III facility. Namely, they are five bacterial diseases (Anthrax, Brucellosis, Tuberculosis, Q-fever and Contagious Bovine Pleuropneumonia), fourteen viral diseases (Rabies, Swine Influenza, HPAI, FMD, Vesicular Stomatitis, Swine Vesicular Disease, African Swine Fever, Equine Viral Arteritis, Pox, Rift Valley Fever, Blue Tongue, Peste des petits ruminants, African Horse Sickness and West Nile Fever) and one prion disease (BSE).

## The outline of the facility

Totally, BSL/ABSL-III area measures about 900 square meters and a third of the facility includes ABSL-III. The new BSL/ABSL-III facility consists of three sectors – shower-out BSL-III, ABSL-III and no-shower out BSL-III facilities. At the shower-out BSL-III sector, six rooms are established to cover one to seven pathogens based on the relative frequency of users. And an equipment room are assigned for ABSL-III sector is composed of seven rooms for small laboratory animals (mouse, chicken, duck, ferret, guinea pig, rabbit and miniature pig) and autopsy room. Each room has a customized isocage system for animal species. No-shower out sector is designed for only one pathogen (BSE), which has four rooms for diagnosis, tissue culture, histopathology and mouse isocages.(Figure. 1)

In addition, some issues are also considered to improve compatibility;

- The accessibility to other BSL-II laboratories
- Development of effective Standard Operating Procedure Manuals which can cover various pathogens

Figure. 1 Layout of a new BSL/ABSL-III facility



## Significance of the work

This kind of facility is hard to modify once it is constructed. At the beginning of design, proper grouping of pathogens based on the relative frequency of usage and subsequent through risk assessment need to be conducted by the users and architects together. And another situation should be considered that a new ABSL-III guideline is being established by KCDC. It will be legislated in 2014. But, our design was completed at the end of 2013 and the construction started from JAN, 2014. There is a possibility that the design of ABSL-III can be changed according to a new guideline. After completion, this new BSL/ABSL-III facility will contribute to researchers' health and environmental protection.

## References

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